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ABSTRACT

GRADES OR AGES: Grade Twelve. SUBJECT MATTER: This is the second part of a two-part course on body structure and function. The subject matter includes organization, composition, and all the systems of the human body. Laboratory experiments related to first aid are also covered. ORGANIZATION AND PHYSICAL APPEARANCE: The guide contains a preface, a list of goals, a list of specific block objectives, a bibliography, course descriptions for each of the 11 blocks, and a quinmester posttest. The 11 blocks are as follows: a) The Blood; b) The Heart; c) The Blood Vessels and Blood Circulation; d) The Lymphatic System and Lymphoid Tissue; e) Body Temperature and Its Regulation; f) Digestion and Indigestion; g) Respiration; h) The Urinary System; i) Glands, Secretions, Hormones; j) The Reproductive System; and k) Fertilization and Development of the Embryo. OBJECTIVES AND ACTIVITIES: Objectives are expressed in the list of goals, in specific block objectives, and within the outlines themselves. INSTRUCTIONAL MATERIALS: A bibliography lists basic and supplementary references, periodicals, and films. STUDENT ASSESSMENT: No provision is indicated. OPTIONS: The course is required. (Related document is SP 007 537.)

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Course Outline

COOPERATIVE HEALTH OCCUPATION EDUCATION - 8009
(Body Structure and Function II)

Department 48 - Course 8009.09.

SP 007 537

the division of

VOCATIONAL, TECHNICAL AND ADULT EDUCATION

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Miami, Florida 33135

Course Description

8009	48	8009.09	Body Structure and Function II
State Category Number	County Dept. Number	County Course Number	Course Title

This quinmester course includes organization, composition, and all the systems of the human body. Laboratory experiments related to first aid will be covered.

Indicators of Success: This is the second part of a two part course of study on body structure and function. It is recommended that the student be an accepted participant in the Cooperative Health Occupations Education Program.

Clock Hours: 45

PREFACE

The primary aim of this course outline is to introduce the learner to principles of the biological and physical sciences that contribute to his understanding of human body processes in normal and in certain abnormal conditions. The sciences of the body structure (anatomy), dynamics and function (physiology), and disease (pathology) will not be covered in depth due to the limited experience of the learner and the hours allotted to present the course.

This course is designed to provide the learner with basic knowledge and understanding of the normal functional relationships of the body so that he may have a better understanding and appreciation of himself as a contributor and participant on the health team in his role as an auxiliary health assistant.

This course will be one of four quins required throughout the school year for the twelfth grade student participating in the Cooperative Health Occupations Program. In addition to the classroom instruction, the learner will receive on-the-job training in a health occupation.

The material for this quinmester course of study consists of twelve blocks, covering a period of forty-five classroom hours, or one nine-week quinmester. Students attend one class period per day, five days a week.

The teacher-coordinator may present the material through his own lectures as well as through the use of guest speakers. Because of the nature of the course, it is suggested that a registered nurse would be able to better relate the learner to the aspect of

illness. Many of the local and national organizations that have special interests concerning the health of certain of the body systems, offer freely their time, films, printed handouts and literature to enhance the student's interest in facing problems of disease in the human body. Round-table discussions, charts, visual aids, demonstrations and field trips are all used effectively in presenting this quinmester course.

The bibliography in this outline lists the sources where selections may be found to fit the individual teacher's lesson plans.

This outline was developed through the cooperative efforts of the instructional and supervisory personnel, the Quinmester Advisory committee, and the Vocational Teacher Education Service, and has been approved by the Dade County Vocational Curriculum Committee.

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Blood Groups	1
Rh Factor	1
Blood Disorders	1
Routine Blood Studies	1

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Physiology of the Heart	2
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GOALS

The student must be able to:

1. Demonstrate an understanding of the basic structure and function of the human body.

2. Develop an appreciation of the interrelation of the various systems of the human body.

3. Understand the normal functions of the body as a basis for developing competency as an auxiliary health assistant.

4. Apply the knowledge gained about the musculo-skeletal system by using good body mechanics at all times.

5. Exhibit the ability to relate the functions of organs of special senses to other parts of the body.

6. Determine the factors involved in order to safely reproduce a child.

7. Accept the difference in rates and in status of growth and development evident between himself and others.

8. Describe the influence of endocrine secretions on growth and development.

9. Understand that malfunctioning of the organism may be characterized by physical effects, emotional reactions, and social concerns.

10. Name various methods by which disease can be prevented, controlled, or cured.

11. Compare and contrast the structure and function of the male and female reproductive systems.

SPECIFIC BLOCK OBJECTIVES

BLOCK I - THE BLOOD

The student must be able to:

1. Distinguish verbally how the color of blood varies with the amount of oxygenation.
2. List the two main purposes of blood.
3. State the names usually given the four main blood groups, and the factors that are the reason for the different groupings.
4. Identify the problem the Rh factor of blood may bring about in childbirth.
5. List the three general categories of blood disorders, differentiating between the two types of anemias and give an example of each.
6. Identify three common blood tests, and state why this is a requirement por people seeking to wed.
7. List the four main constituents of blood and give the function of each with 100% accuracy.

BLOCK II - THE HEART

The student must be able to:

1. Draw a heart and label the following: 3 layers, 4 chambers, 4 valves, and the septum.
2. Describe fully the cardiac cycle including: systole, diastole, nerve supply.
3. State four means by which a person may live in order to prevent an ailment of his heart.
4. List three means by which heart trouble is detected, also naming two innovative methods currently being employed by physicians to repair or replace damaged hearts.

BLOCK III - BLOOD VESSELS AND BLOOD CIRCULATION

The student must be able to:

1. Name the three main groups of blood vessels and describe their functions, relating the structural effect on the functions.
2. Trace a drop of blood through the shortest possible route from the capillaries of the foot to the capillaries of the head.
3. Demonstrate, using a stethescope and sphygnomonometer, how blood pressure is obtained.
4. Identify four disorders involving the blood vessels.

BLOCK IV - THE LYMPHATIC SYSTEM AND LYMPHOID TISSUE

The student must be able to:

1. List the components of lymph.
2. Briefly describe in writing the system of lymph circulation.
3. Tell a young mother why it is important that her child retain his tonsils, adenoids, and appendix as long as they are not overly diseased.
4. Describe the structure of a typical lymph node.
5. Define Hodgkin's disease, giving symptoms and treatment.

BLOCK V - BODY TEMPERATURE AND ITS REGULATION

The student must be able to:

1. List four aspects of homeostasis.
2. Compare, using examples of each, the human body that is suffering from excessive heat loss, with the human body that is suffering from excessive production of heat.
3. Define fever, name some aspects of its course, and list some of its beneficial and detrimental effects.

BLOCK VI - DIGESTION AND INDIGESTION

The student must be able to:

1. List the functions of the digestive system.
2. Trace the path of an indigestible object from the mouth through all parts of the alimentary canal to the outside, and tell what happens on the way.
3. List three accessory structures that work closely with the digestive system, identifying the function and secretion of each.
4. Distinguish verbally between food fads and fallacies and diets based on scientific principles of nutrition.

BLOCK VII - RESPIRATION

The student must be able to:

1. Describe the purpose of respiration, its two aspects.
2. Trace the pathway of air from the outside into the blood.
3. Describe normal breathing, including: 2 phases, respiratory rate, mechanism of breathing, and nerve control.
4. Name three possible developments or complications of upper respiratory infections, tracing the course of infection down the respiratory tract and give the name for the inflammation of each area.
5. Demonstrate four types of abnormal breathing, explaining the conditions that must exist to bring about these types of respiration.
6. List three characteristics of ideal ventilation.

BLOCK VIII - THE URINARY SYSTEM

The student must be able to:

1. Compare the similarity of secretions and excretions and contrast their differences.
2. List the structure and function of the organs of the urinary system.
3. Define and tell the possible significance of five abnormal constituents of urine.
4. State the reason it is necessary to have at least one kidney functioning adequately in the human body at all times.

BLOCK IX - GLANDS, SECRETIONS, HORMONES

The student must be able to:

1. Define the term hormone.
2. List four hormones of the human body, giving locations and effect.
3. Identify the separate growth and development changes that occur in males and females during adolescence.
4. Describe how growth and development occurs unevenly for body parts, systems, and functions.

BLOCK X - THE REPRODUCTIVE SYSTEM

The student must be able to:

1. Name all parts of the male reproductive system and describe the function of each.
2. Name the principal parts of the female reproductive system and describe the function of each.

BLOCK XI - FERTILIZATION AND DEVELOPMENT OF THE EMBRYO

The student must be able to:

1. Outline briefly the following processes: conception, development of the embryo and fetus, parturition.
2. Use medical terminology to demonstrate, in writing, an understanding of the normal birth of a baby by a human.
3. State three aspects of prenatal care which help to insure the delivery of a normal baby.
4. Define: ectopic pregnancy, placenta previa, abortion, miscarriage.

Course Outline

COOPERATIVE HEALTH OCCUPATION EDUCATION - 8009
(Body Structure and Function II)

Department 48 - Course 8009.09

I. THE BLOOD

A. Medical Terminology

B. General Characteristics
1. Appearance - color
2. Volume
3. Odor

C. Purpose of Blood
1. Transportation
2. Heat exchange
3. Body defense

D. Prime Elements of Blood
1. Plasma (liquid element)
2. Formed elements (cell and cell derived):
a. Erythrocytes:
(1) Purpose
(2) Constituents
b. Leukocytes:
(1) Purpose
(2) Constituents
c. Platlets:
(1) Purpose
(2) Constituents

E. Blood Groups
1. Compatibility
2. Blood types

F. Rh Factor
1. Negative
2. Positive
Erythroblastosis fetalis

G. Blood Disorders
1. Anemias:
a. Primary
b. Secondary
2. Neoplastic diseases
3. Hemorrhagic diseases

H. Routine Blood Studies
1. Hemoglobin amount
2. Total red and white blood counts
3. Examine blood slide:
a. Differential white count
b. Parasites

II. THE HEART

A. Medical Terminology

B. Structure of the Heart
   1. Layers of the heart wall:
      a. Endocardium
      b. Myocardium
      c. Pericardium
   2. Two hearts and a partition
   3. Four chambers:
      a. Atriums
      b. Ventricles
   4. Four valves:
      a. Tricuspid valve
      b. Pulmonary semilunar valve
      c. Mitral valve
      d. Aortic valve

C. Physiology of the Heart
   1. Work of the heart:
      a. Systole
      b. Diastole
   2. Nerve supply to control beat
   3. Conduction system of the heart:
      a. Nodes:
         (1) Sinoatrial node
         (2) Atrioventricular node
      b. Bundle of His

D. Disorders of the Heart
   1. Congenital heart disease
   2. Rheumatic heart disease
   3. Coronary heart disease
   4. Degenerative heart disease

E. Prevention of Heart Ailments
   1. Proper nutrition
   2. Prevention and care of infections
   3. Temperate habits and adequate rest
   4. Regular evaluation of physical condition

F. Treatment
   1. Instruments used in heart studies:
      a. Stethoscope
      b. Electrocardiograph
      c. Fluoroscope and catheterization of the heart
   2. Medications:
      a. Digitalis
      b. Anticoagulants
      c. Antibiotics
      d. Doctor's supervision
   3. Pacemakers

II. THE HEART (Contd.)

4. Heart surgery:
   a. Artificial valves as replacements
   b. Transplants and rejection problems

III. BLOOD VESSELS AND BLOOD CIRCULATION

A. Medical Terminology

B. Blood Vessels
   1. Functional classification
   2. Two circuits:
      a. Pulmonary vessels
      b. Systemic vessels
   3. Structure of blood vessels:
      a. Arteries
      b. Capillaries
      c. Veins

C. Circulation
   1. Names of systemic arteries
   2. Names of systemic veins

D. Pulse and Blood Pressure

E. Disorders Involving the Blood Vessels

IV. THE LYMPHATIC SYSTEM AND LYMPHOID TISSUE

A. Medical Terminology

B. Lymph Composition

C. Lymphatic Conduction

D. Lymphoid Tissue
   1. Tonsils
   2. Thymus
   3. Spleen

E. Lymph Nodes

F. Disorders of Lymphatic System and Lymphoid Tissue

V. BODY TEMPERATURE AND ITS REGULATION

A. Medical Terminology

B. Homeostasis
   1. Heat production
   2. Heat loss

V. BODY TEMPERATURE AND ITS REGULATION (Contd.)

C. Temperature Regulation
   1. Hypothalmus
   2. Normal body temperature
   3. Abnormal body temperature

VI. DIGESTION AND INDIGESTION

A. Medical and Dental Terminology

B. Digestive System
   1. Functions
   2. Components

C. Alimentary Canal
   1. Mouth or oral cavity
   2. Swallowing tubes and their accessories:
      a. Pharynx
      b. Uvula
      c. Epiglottis
      d. Esophagus
   3. Stomach:
      a. Characteristics and accessory structures
      b. Disorders
   4. Small intestine:
      a. Divisions
      b. Digestive juices and sources
      c. Absorption
   5. Large intestine
   6. Intestinal disorders

D. Accessory Structures
   1. Liver
   2. Gallbladder
   3. Pancreas

E. Diseases of the Intestinal Tract

F. Nutrition

VII. RESPIRATION

A. Medical Terminology

B. Respiration
   1. Purpose
   2. Divisions:
      a. External
      b. Internal

C. Organs of Respiration

VII. RESPIRATION (Contd.)

D. Physiology of Respiration

E. Common Diseases of the Respiratory Tract

F. Ventilation

VIII. THE URINARY SYSTEM

A. Medical Terminology

B. Excretion and Elimination

C. Organs of Urinary System
   1. Kidneys:
      a. Location
      b. Structure
      c. Function
      d. Diseases
      e. Dialysis and transplants
   2. Ureters:
      a. Structure
      b. Function
   3. Bladder:
      a. Structure
      b. Function
   4. Urethra:
      a. Structure
      b. Function

D. Urine
   1. Normal constituents
   2. Abnormal constituents

E. Common Conditions of the Urinary Tract

IX. GLANDS, SECRETIONS, HORMONES

A. Medical Terminology

B. Classification
   1. According to place of secretion
   2. According to kind of secretion
   3. According to structure

C. Structure
   1. Exocrine
   2. Endocrine

D. Physiology
   1. Body regulators

IX. GLANDS, SECRETIONS, HORMONES (Contd.)

2. Chemical messengers
3. Control various sex processes

E. Common Conditions of the Endocrine System

X. THE REPRODUCTIVE SYSTEM

A. Medical Terminology

B. Male Reproductive System
1. Parts and Functions
2. Disorders

C. Female Reproductive System
1. Parts and functions
2. Menstrual cycle
3. Menopause
4. Disorders

XI. FERTILIZATION AND DEVELOPMENT OF THE EMBRYO

A. Medical Terminology

B. Fertilization

C. Development of the Embryo
1. First stages
2. Embryo
3. Fetus
4. Gestation

D. Childbirth

E. Mother and Infant

F. Common Conditions of Reproduction

XII. QUINMESTER POST TEST

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Supplementary Materials:

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15. Metropolitan Life Insurance Company, Hialeah District Office, 990 W. 49th Street, Hialeah, Florida. Pamphlet - "Your Heart."

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1. Alimentary Tract. 16 mm. 11 min. B/W. Sound. Audio-visual Services, Dade County Board of Public Instruction. #1-03113.

2. Changing View of Change of Life. 16 mm. 28 min. Color. Sound. Florida Board of Health. #872.

3. Circulation: Why and How. 16 mm. 10 min. Color. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-03089.

4. Diabetes and You, Too. 16 mm. 21 min. Color. Sound. Florida State Board of Health. #493.

5. Emergency Childbirth. 16 mm. 27 min. Color. Sound. Florida State Board of Health. #510.

6. Endocrine Glands: How They Affect You. 16 mm. 15 min. B/W. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-11367.

7. Have a Healthy Baby. 16 mm. 16 min. Color. Sound. Florida State Board of Health. #880.

8. Healthy Lungs. 16 mm. 10 min. Color. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-03058.

9. Heart Attack. 16 mm. 22 min. Color. Sound. Florida State Board of Health. #570.

10. Heart, Lungs, Circulation. 16 mm. 11 min. Color. Sound. Audiovisual Services, Dade County Board of Public Instruction. #1-03104.

11. Hemo the Magnificent. 16 mm. 28 min. Color. Sound. Ideal Pictures.

12. Human Body: Digestive System. 16 mm. 13 min. B/W. Sound. Florida State Board of Health. #585.

13. Human Heredity. 16 mm. 20 min. Color. Sound. Florida State Board of Health. #590.

14. Human Reproduction. 16 mm. 20 min. B/W. Sound. Florida State Board of Health. #591.

15. It's Wonderful Being a Girl. 16 mm. 20 min. Color. Sound. Florida State Board of Health. #614.

16. Mechanisms of Breathing. 16 mm. 10 min. B/W. Sound. Florida State Board of Health. #196.

17. Reproduction in Proper Taste. 16 mm. 20 min. Color. Sound. Florida State Board of Health. #583.

18. Story of Menstruation. 16 mm. 10 min. Color. Sound. Florida State Board of Health. #250.

19. Signposts. 16 mm. 14 min. B/W. Sound. Florida State Board of Health. #757.

20. To Let a Boy Play Ball. 16 mm. 14 min. Color. Sound. Florida State Board of Health. #788.

A P P E N D I X

Quinmester Post Test Sample

QUINMESTER POST TEST

Name _____ Date _____ Score ____

I. Short Answer - Answer the following questions by a single word, phrase or choice of words as indicated in the parentheses. Read the complete statement carefully before answering.

1. Anatomy is the branch of biology which studies the form and _____ of living things.

2. Physiology is the branch of biology which studies the _____ of living things.

3. Contraction of the heart muscle is called (a) _____ and relaxation of the heart muscle is called (b) _____.

4. The reflex center for circulatory and respiratory impulses is located in the _____.

5. The collective name for the male and female sex glands is (a) _____. The main male sex glands are called (b) _____, and the main female sex glands are called the (c) _____.

6. The general function of the glands of the endocrine system is to regulate the body's _____ processes.

7. Of the quantity of water filtered in the kidney, about (a) _____% is reabsorbed passively, by osmosis. How much of the remainder will be reabsorbed depends on the action of the posterior pituitary hormone called (b) _____ _____. This hormone acts to (increase, decrease) (c) _____ water absorption.

II. Multiple Choice - Each statement needs a word or phrase to make it correct. Only one of the choices listed is correct. Place a circle around the letter of the choice you make. Read all statements carefully.

1. Gastric juice is:

   a. Highly alkaline
   b. Somewhat alkaline
   c. Neutral
   d. Somewhat acidic
   e. Highly acidic

2. The lymphatic vessels carry lymph to:

   a. The tissue
   b. The bloodstream
   c. Neither
   d. Both

3. If a patient had his larynx removed, he would not be able to:

   a. Eat
   b. Breathe
   c. Speak
   d. Drink

III. Label correctly the numbered parts of the following drawings as indicated: (Only medical terminology acceptable.)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

IV. Matching - The words and phrases in Column I are significant in connection with an expression in Column II. Match them properly by placing the figure preceding the item in Column I in the brackets at the left of the matching item.

Column I

( ) 1. Mammary glands
( ) 2. Sweat glands
( ) 3. Red blood cell
( ) 4. Thrombocyte
( ) 5. Leukocyte
( ) 6. Blood platelets
( ) 7. Simple sugar
( ) 8. Simple proteins

(a) Form blood clots
(b) Glucose
(c) Placenta
(d) Help to regulate body temperature
(e) Amino acids
(f) Erythrocytes
(g) Thrombocytes
(h) Form antibodies
(i) Transfusion
(j) Produce milk

V. List or name the information requested in the following statements. These may be in any order you desire. Think.

1. Name three important functions of the liver.

   a. _____

   b. _____

   c. _____

2. Name the two organs formed during early pregnancy through which nutrients are transmitted to, and waste materials are removed from, the developing child.

   a. _____

   b. _____

3. An incompatible transfusion occurs when _____

   _____

   _____

   (Use your own words.)

ANSWER KEY TO QUINMESTER POST TEST

I. Short Answer

1. Structure
2. Life function (functions)
3. (a) Systole
   (b) Diastole
4. Medulla oblongata
5. (a) Gonads
   (b) Testes
   (c) Ovaries
6. Metabolic or life
7. (a) 85%
   (b) Antidiuretic hormone or ADH
   (c) Increase

II. Multiple Choice

1. e
2. b
3. c

III.
1. Trachea
2. Bronchus
3. Bronchiole
4. Alveoli
5. Left ventricle
6. Septum
7. Superior vena cava
8. Aorta

IV. Matching

1. j
2. d
3. f
4. a
5. h
6. g
7. b
8. e

1. Any three of the following:
   a. Secretion of bile
   b. Storage of glycogen, vitamins, copper, iron
   c. Production of coagulants
   d. Production of anticoagulants
   e. Detoxication
2. a. Placenta
   b. Umbilical cord
3. A persons with one type of blood receives a transfusion from a donor with a different type of blood.